Claim Amendments:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Canceled)

2. (Previously Presented) The method of claim 6, wherein the target material is a semiconductor substrate.

3. (Previously Presented) The method of claim 6, wherein the target material is any substance to be implanted using the ion beam.

4. (Canceled)

5. (Previously Presented) The method of claim 6, wherein a characteristic is selected from a group consisting of: beam current, beam energy, beam scan rate, vacuum, gas pressure, and ion dose.

6. (Previously Presented) A method of exposing a target material to an ion beam in an ion implantation system, the method comprising:

detecting an ion beam at a first location with a first detector;

detecting the ion beam at a second location with a second detector at the same time as the first detector;

quantifying an amount of ion beam neutralization based upon a measurement deviation between the first detector and the second detector, wherein quantifying includes determining a reference ratio at a first ion beam current at the first location of a processing chamber and the second location of a processing chamber, wherein the first location is further from a first target of the ion beam than the second location;

determining a current ratio of a second ion beam current at the first location and the second location, wherein the second ion beam current is being used to process a second target; and

determining a charge neutralization component of the ion beam at the second target location based on the reference ratio and the current ratio; and

controlling a characteristic of the ion beam of the implantation system based upon the amount of ion beam neutralization.

7. (Original) The method of Claim 6, wherein the reference ratio is determined when a relatively high-level, stable vacuum exists along the ion beam line and no target material is present.

8. (Original) The method of Claim 6, wherein the reference ratio is determined at the beginning of implantation when a relatively high-level, stable vacuum exists along the ion beam line and target material is present.

9. (Previously Presented) The method of claim 6, wherein controlling includes:

modifying the ion dose based upon the charge neutralization component to create a total dose; and

adjusting a process parameter based on the total dose.

10. (Original) The method of claim 9, wherein a process parameter is selected from a group consisting of: beam current, beam energy, beam scan rate, vacuum, gas pressure, and ion dose.

11. (Previously Presented) The method of claim 6, wherein the second detector is fixed in place and sited adjacent to the target position.

12. (Previously Presented) The method of claim 6, wherein the second detector is moveable and sited adjacent to the target position during measurement.

13. (Previously Presented) The method of claim 6, wherein the second detector is fixed in place and sited behind the target position.

14. (Previously Presented) The method of claim 6, wherein the second detector is moveable and sited behind the target position.

15. (Previously Presented) The method of claim 6, wherein the second detector is sited along the beam path to the target position.

16. (Original) The method of Claim 6, wherein the reference ratio is in the range of approximately 100:1 to 1:1.

17. (Previously Presented) The method of claim 16, wherein the range of the reference ratio is dependent upon the location of a first detector with reference to a second detector.

18. (Original) The method of Claim 16, wherein the reference ratio may be a previously stored value retrieved from control software.

19. (Canceled)

20. (Canceled)

21. (Previously Presented) The system of claim 22, wherein a characteristic is selected from a group consisting of: beam current, beam energy, beam scan rate, vacuum, gas pressure, and ion dose.

22. (Previously Presented) A system comprising:

memory;

a processor operably connected to said memory;

a program of instructions, said program of instructions including instructions to receive a first measurement from a first detector and to receive a second measurement from a second detector, and to manipulate said processor to:

quantify an amount of ion beam neutralization based upon a measurement deviation between the first detector and the second detector, wherein the first detector and the second detector measure an ion beam at the same time, where to quantify includes

determining a reference ratio at a first ion beam current at a first location of a processing chamber and a second location of a processing chamber, wherein the first location is further from a first target of the ion beam than the second location;

determining a current ratio of a second ion beam current at the first location and the second location, wherein the second ion beam current is being used to process a second target;

determining a charge neutralization component of the ion beam at the second target location based on the reference ratio and the current ratio; and

control a characteristic of the ion beam of an ion implantation system based upon the amount of ion beam neutralization.

23. (Previously Presented) The system of claim 22, wherein controlling includes:

modifying the ion dose based upon the charge neutralization component to create a total dose; and

adjusting a process parameter based on the total dose.

24. (Original) The system of claim 23, wherein a process parameter is selected from a group consisting of:

beam current, beam energy, beam scan rate, vacuum, gas pressure, and ion dose.

25. (Canceled)

26. (Canceled)